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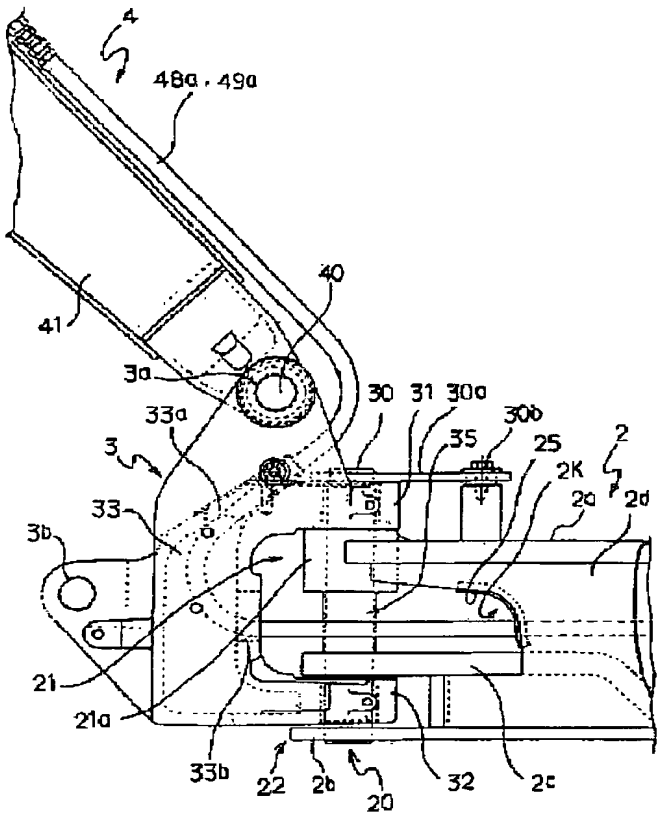
APPLICATION DATE : 15-10-96
APPLICATION NUMBER : 08272461

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INVENTOR : SATO KAZUO;

INT.CL. : E02F 9/00

TITLE : WORKING-SECTION SUPPORTING STRUCTURE OF HYDRAULIC WORKING MACHINE



ABSTRACT : PROBLEM TO BE SOLVED: To provide the working-section supporting structure of a hydraulic working machine, in which the wear, etc., of a hydraulic hose piped from a machine base to a working section are prevented well while the working section can be operated and supported smoothly.

SOLUTION: In the working-section supporting structure of the hydraulic working machine, a mounting bracket 3 supporting a working section 4 is installed swingably to the boss section 20 of a machine base 2 through the mounting pin 30 of a vertical shaft. A hydraulic hose for operating the working section 4 is passed into the machine base 2 and the mounting bracket 3, and the boss section 20 is parted into an upper boss section 21 and a lower boss section 22 and divided and formed while the hydraulic hose is disposed near to the shaft section of the mounting pin 30 inserted to the upper and lower boss sections 21, 22.

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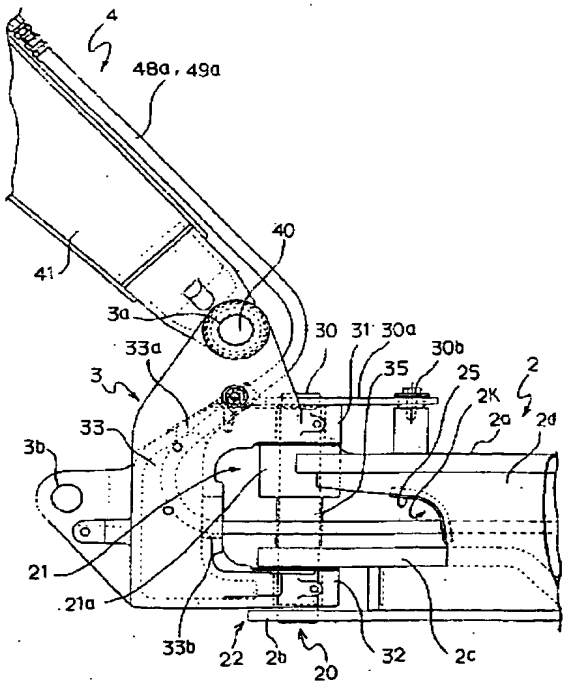
(74)代理人　弁理士　小川　信一　（外２名）

(54)【発明の名称】　油圧作業機の作業部支持構造

(57)【要約】

【課　題】　機台から作業部に配管される油圧ホースの損耗等を良好に防止するとともに、作業部を円滑に作動支持することができる油圧作業機の作業部支持構造を提供する。

【解決手段】　機台２のボス部２０に対し作業部４を支持する取付ブラケット３を縦軸の取付ピン３０を介して旋回可能に取付けるとともに、上記作業部４を作動させる油圧ホースを機台２内及び取付ブラケット３内を通し、前記ボス部２０を上ボス部２１と下ボス部２２とに離間させて分割形成するとともに、上記上下ボス部２１，２２に挿通した取付ピン３０の軸部と近接させて油圧ホースを配設した油圧作業機の作業支持構造。



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【特許請求の範囲】
【請求項１】　機台２のボス部２０に対し作業部４を支持する取付ブラケット３を縦軸の取付ピン３０を介して旋回可能に取付けるとともに、上記作業部４を作動させる油圧ホースを機台２内及び取付ブラケット３内を通してなる油圧作業機において、
前記ボス部２０を上ボス部２１と下ボス部２２とに離間させて分割形成するとともに、上記上下ボス部２１，２２に挿通した取付ピン３０の軸部と近接させて油圧ホースを配設して成る油圧作業機の作業支持構造。
【請求項２】　上ボス部２１と下ボス部２２との間において、取付ピン３０に油圧ホース案内用の回転ローラ３５を嵌挿して成る請求項１記載の油圧作業機の作業部支持構造。
【請求項３】　ボス部２０の基部側に形成される油圧ホース挿通用の開口部２Ｋの両側内面に油圧ホース案内用の滑動部材２５を形成して成る請求項１又は２の何れかに記載の油圧作業機の作業部支持構造。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、パワーショベル等油圧作業機の作業部支持構造に関する。
【０００２】
【従来の技術】従来、パワーショベルのバケット等を有する作業部の支持構造は、図５に示すように機台２の前端部に上下方向に長い縦筒状のボス２０ａを固着してボス部２０を構成するとともに、作業部４を支持する取付ブラケット３の取付片３１，３２を上記ボス２０ａを上下から挟持した状態に嵌挿して両者を取付ピン３０によってスイング回動可能に連結し、作業部４を作動させる油圧ホース（４７ａ，４８ａ，４９ａ）を機台２内からボス２０ａの側方を周回させるとともに、取付ブラケット３内を通して作業部４に設けられる各油圧シリンダーと連結させるようにしている。
【０００３】
【発明が解決しようとする課題】然し、上記従来の作業部の支持構造は、取付ブラケット３がスイングシリンダの作動によって、取付ピン３０を中心に左右に旋回動作するとき、この取付ブラケット３の動きに伴って左右に屈伸変曲する油圧ホース（４７ａ，４８ａ，４９ａ）が、取付ピン３０を挿通支持するように大きな径に形成されたボス２０ａに強く摺接することにより、早期に損耗等を発生し易い欠点があるとともに、油圧ホースは上記屈伸変曲に伴い機台２に開口する開口部内を出入り動作する際に、この開口部の内側に強く接して油圧ホース（４７ａ，４８ａ，４９ａ）の円滑な出入り作動に支障を与えたり、著しい損耗を生ずる等の問題がある。
【０００４】
【課題を解決するための手段】上記従来の問題を解決するために本発明の油圧作業機の作業部支持構造は、機台２のボス部２０に対し作業部４を支持する取付ブラケット３を縦軸の取付ピン３０を介して旋回可能に取付けるとともに、上記作業部４を作動させる油圧ホースを機台２内及び取付ブラケット３内を通してなる油圧作業機において、前記ボス部２０を上ボス部２１と下ボス部２２とに離間させて分割形成するとともに、上記上下ボス部２１，２２に挿通した取付ピン３０の軸部と近接させて油圧ホースを配設するようにしている。
【０００５】
【発明の実施の形態】本発明の一実施形態を図面に基づいて説明する。図１において、１は作業機の１例として示すパワーショベルであり、クローラ式の走行装置１ａの基柱１ｂに旋回可能に設けられた機台２の前方に取付ブラケット（スイングポスト）３を介してショベル４５等の作業部４を設けるとともに、後方に操縦部５とタンク部６を機幅の左右に併設して原動部７を順次配設して構成されている。
【０００６】上記操縦部５は機台２の上部に着脱可能に敷設した床板（フロアー）８の後方中央部にシート部（座席）５ａを設け、この両側で機台２から立設支持する操縦支枠５ｂ，５ｃに作業部４及び機台２等の操作を司る操作レバー５Ｌ，５Ｒを設置するとともに、シート５ａの前方で乗降空間部５Ｋを隔てた機台２の前端部に機体の操向操作を司る操向レバー５Ｓを上方に向けて立設し、その基部の側方に図示しないアタッチメント作業機等の操作を司るフートペダル５Ｆ等が設置される前面操舵部５ｄを配置している。なお、図１はパワーショベルを、図２はブレード作業機を示しているが、操縦部５は同様な構成になっている。
【０００７】上記作業部４は在来のものと同様な構成により、図３に示す如く基部を取付ブラケット３の取付部３ａに支軸４０を介して枢支されるブーム４１の先端にアーム４２を支軸４３を介して枢支し（図１）、このアーム４２の先端にバケット４５をバケットリンク４６を介して枢支するとともに、これらにそれぞれブームシリンダ４７、アームシリンダ４８、バケットシリンダ４９を設けて各作業を行なうようにしている。
【０００８】また、上記各シリンダ４７，４８，４９の油圧ホース４７ａ，４８ａ，４９ａは、以下に記す構成によって取付ブラケット３及びボス部２０を経て機台２に形成された開口部２Ｋ内を通り、この機台２内に設置されて前記操作レバー５Ｌ，５Ｒで切換操作される図示しない油圧切換バルブ（コントロールバルブ）に接続している。
【０００９】また上記取付ブラケット３は図３、図４に示すように、鋳物製の本体の上部に前記取付部３ａを形成し前面にブームシリンダ４７を支持する取付部３ｂを形成し、且つ左側面に機台２側に取付けられたスイングシリンダ４５を支持する取付部３ｃを突出形成するとともに、後面に逆コ字状の二又片に形成した取付ピン３０

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挿通用のメタル部を有する取付部３１，３２を突設している。そして本体の内部には、上下の通孔３３ａ，３３ｂ（図３）を有する中空部３３を形成し、この中空部３３内に前記油圧ホース４８ａ，４９ａを挿通させている。

【００１０】一方、機体２の前方側に向けて突出形成した機台２の先端部に設けられるボス部２０は上ボス部２１と下ボス部２２とに離間させて分割形成するとともに、両者間の空間部に既述の油圧ホース４７ａ，４８ａ，４９ａ等を挿通させるようにしている。即ち、この部分における機台２は肉厚な平板からなる上枠２ａと下枠２ｂ及び中枠２ｃの両外縁を側枠２ｄで正面視中空箱枠状に一体的に構成し、側面視で上枠２ａと中枠２ｂとの間における側枠２ｃの先端部位を凹入切欠することにより油圧ホースを挿通し、その可動を許容する開口部２Ｋを形成している。

【００１１】そして上枠２ａの先端部には前記取付ブラケット３の取付部３１を載置した状態で取付ピン３０を挿通させる円筒状のボス２１ａを固着して上ボス部２１を形成するとともに、中枠２ｃと下枠２ｂの先端部は、前記取付部３２を挟持状に挿入支持して取付ピン３０を挿通させる下ボス部２２を形成している。これにより取付ブラケット３はその取付部３１，３２をそれぞれ上ボス部２１と下ボス部２２に位置決めした状態で取付ピン３０を一連に挿通することにより機台２のボス部２０に取付ピン３０を中心に左右方向に旋回（スイング作動）可能に支持することができる。

【００１２】また上ボス部２１と下ボス部２２間の取付ピン３０の軸部には滑動面に形成された円筒状の回転ローラ３５を回動可能に軸装するとともに、前記開口部２Ｋのコーナー部には油圧ホースが接当したとき滑動案内を良好に行なうことができる滑動部材２５を両側枠２ｄに設けている。なお、上記取付ピン３０はその上部に固着した固定アーム３０ａを機台２に取付ネジ３０ｂによって取付け固定することにより回り止めを行なっている。

【００１３】以上のように構成した作業部支持構造は、スイングシリンダ４５の作動によって取付ピン３０を中心に取付ブラケット３が左右に旋回するとき、その動作に伴って、この取付ピン３０の側方を通って配管されている油圧ホース４８ａ，４９ａ・・等（油圧ホース群）は左右方向に追動するがこの追動時において油圧ホース群は上ボス部２１と下ボス部２２との間において小径な取付ピン３０に接近してより旋回中心側で屈伸変曲を可及的に少なくした状態で行なうことができるので、ホース長も短くすることができるとともに開口部２Ｋに対する出入り作動も少なくすることができる。また油圧ホース群は上記追動作動時抵抗の少ない滑動部材２５及び回転ローラ３５によって円滑に案内されるとともに損耗等を良好に防止されるものである。

【００１４】

【発明の効果】機台の開口部から取付ブラケットを通って作業部に連通された油圧ホースは、該取付ブラケットが左右に旋回されるとき、上ボス部と下ボス部間において小径な取付ピンに近接して上記取付ブラケットに追動することができるので、油圧ホースの大きな屈折や変曲を抑制された状態で円滑に追動することができ油圧ホースの損耗等を防止することができる。

【００１５】また油圧ホースは追動作動時において、開口部の滑動部材及び取付ピンの回転体によって円滑に作動することができるとともに、損耗等を良好に防止することができる。

【図面の簡単な説明】

【図１】パワーショベルの側面図である。

【図２】ブレード作業機に於ける図１のと同様な部分の平面図である。

【図３】作業部支持構造を示す側面図である。

【図４】図３の平面図である。

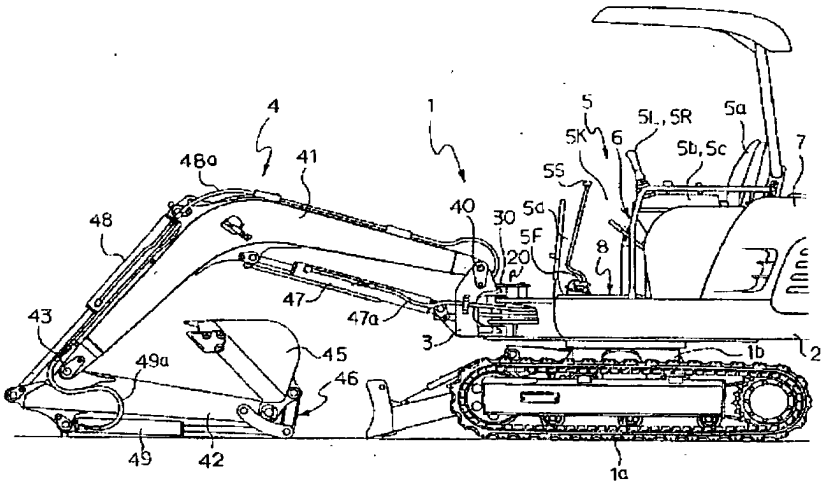
【図５】従来例を示す側面図である。

【符号の説明】

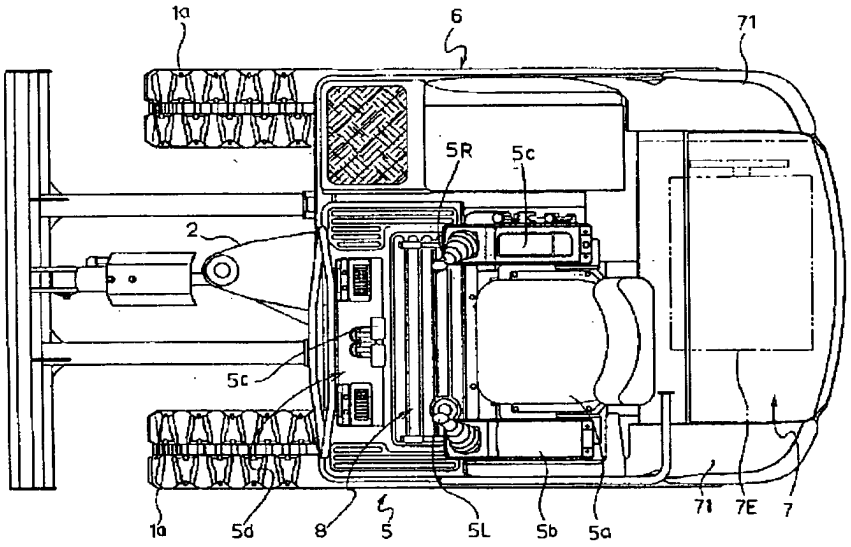
１　パワーショベル	２　機台
３　取付ブラケット	４　作業部
２０　ボス部	２１　上ボス部
２５　滑動部材	３０　取付ピン
３５　回転ローラ	
４７ａ，４８ａ，４９ａ　油圧ホース	

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【図1】

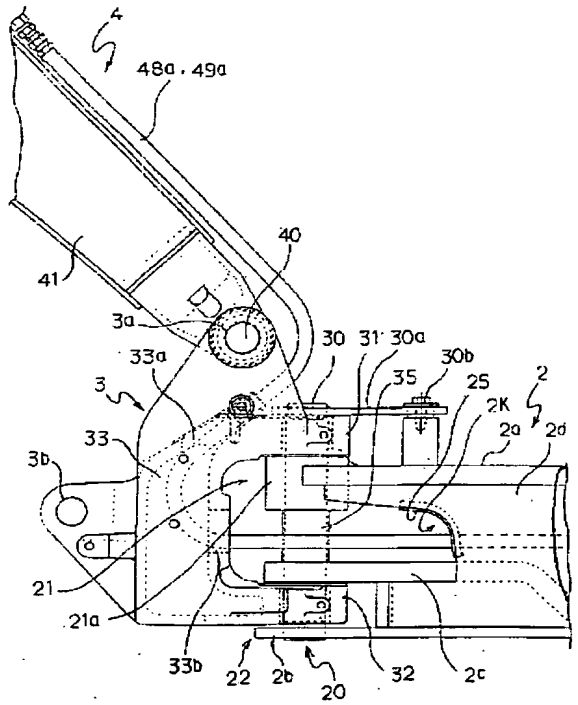


【図2】

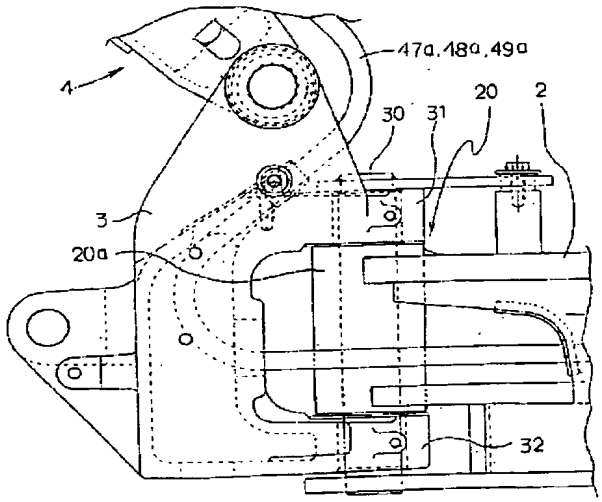


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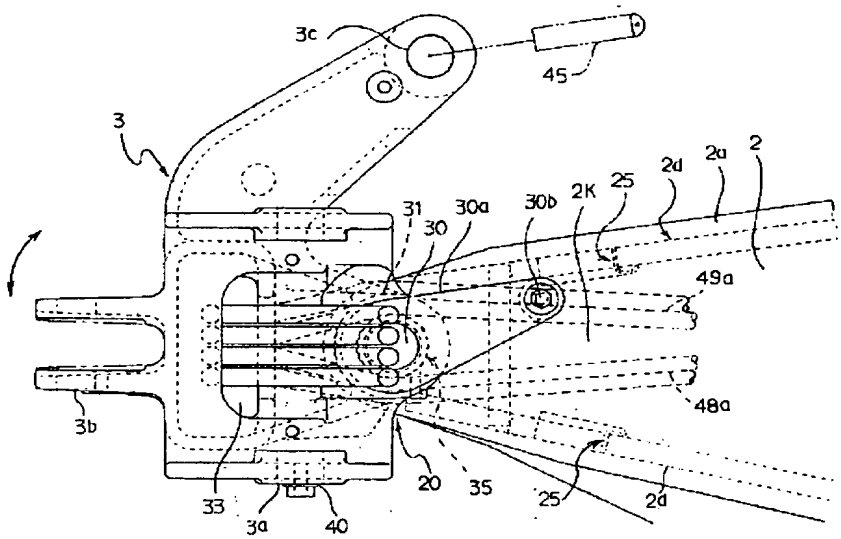
【図3】



【図5】



【図4】



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CLAIMS

[Claim(s)]
[Claim 1] While attaching the mounting bracket 3 which supports the activity section 4 to the boss section 20 of a machine stool 2 possible [revolution] through the attachment pin 30 of an axis of ordinate While making the upper boss section 21 and the bottom boss section 22 estrange said boss section 20 and carrying out division formation in the oil pressure activity machine which comes to let [the inside of a machine stool 2 and a mounting bracket 3] the oil pressure hose which operates the above-mentioned activity section 4 pass The activity supporting structure of the oil pressure activity machine which is made to approach with the shank of the attachment pin 30 inserted in the above-mentioned vertical boss sections 21 and 22, arranges an oil pressure hose, and changes.
[Claim 2] The activity section supporting structure of the oil pressure activity machine according to claim 1 which fits the rotation roller 35 for oil pressure hose guidance in the attachment pin 30, and grows into it between the upper boss section 21 and the bottom boss section 22.
[Claim 3] The activity section supporting structure of an oil pressure activity machine given in claim 1 or any of 2 they are. [which forms the sliding member 25 for oil pressure hose guidance in the both-sides inside of opening 2K for oil pressure hose insertion formed in the base side of the boss section 20, and grows into it]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the activity section supporting structure of oil pressure activity machines, such as a power shovel.
[0002]
[Description of the Prior Art] The supporting structure of the activity section which has the bucket of a power shovel etc. conventionally As shown in drawing 5 , while fixing boss 20a of the shape of a vertical tube long in the vertical direction in the front end section of a machine stool 2 and constituting the boss section 20 It connects rotatable. the condition of having pinched the above-mentioned boss 20a for the pieces 31 and 32 of attachment of the mounting bracket 3 which supports the activity section 4 from the upper and lower sides -- fitting in -- both -- the attachment pin 30 -- swing -- While making the side of boss 20a go around from the inside of a machine stool 2, he is trying to make the oil pressure hose (47a, 48a, 49a) which operates the activity section 4 connect with each oil hydraulic cylinder formed in the activity section 4 through the inside of a mounting bracket 3.
[0003]
[Problem(s) to be Solved by the Invention] A mounting bracket 3 the supporting structure of the above-mentioned conventional activity section however, by actuation of a swing cylinder When carrying out revolution actuation a core [the attachment pin 30] at right and left, the oil pressure hose (47a, 48a, 49a) which carries out expansion-and-contraction inflection to right and left in connection with a motion of this mounting bracket 3 While the fault which is easy to generate consumption etc. is at an early stage by ****ing to boss 20a formed in the big path strongly so that insertion support of the attachment pin 30 may be carried out In case it carries out receipts-and-payments actuation of the opening circles which carry out opening to a machine stool 2 in connection with the above-mentioned expansion-and-contraction inflection, an oil pressure hose touches to the inside of this opening strongly, and trouble is given to smooth receipts-and-payments actuation of an oil pressure hose (47a, 48a, 49a), or it has problems, such as producing remarkable consumption.
[0004]
[Means for Solving the Problem] In order to solve the above-mentioned conventional problem the activity section supporting structure of the oil pressure activity machine of this invention While attaching the mounting bracket 3 which supports the activity section 4 to the boss section 20 of a machine stool 2 possible [revolution] through the attachment pin 30 of an axis of ordinate While making the upper boss section 21 and the bottom boss section 22 estrange said boss section 20 and carrying out division formation in the oil pressure activity machine which comes to let [the inside of a machine stool 2 and a mounting bracket 3] the oil pressure hose which operates the above-mentioned activity section 4 pass He makes it approach with the shank of the attachment pin 30 inserted in the above-mentioned vertical boss sections 21 and 22, and is trying to arrange an oil pressure hose.
[0005]
[Embodiment of the Invention] One operation gestalt of this invention is explained based on a

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drawing. It is the power shovel shown as one example of an activity machine, and in drawing 1 , 1 puts side by side the operation section 5 and the tank section 6 to right and left of a machine width back, it carries out sequential arrangement of the motor unit 7, and is constituted while it forms the activity section 4 of shovel 45 grade through a mounting bracket (swing post) 3 ahead of the machine stool 2 established in main column 1b of traveller 1a of a crawler type possible [revolution].

[0006] The above-mentioned operation section 5 prepares sheet section (seat) 5a in the back center section of the floor plate (floor) 8 laid removable in the upper part of a machine stool 2. While installing the control levers 5L and 5R which manage actuation of the activity section 4 and machine stool 2 grade in operation **** 5b and 5c which carry out set-up support from a machine stool 2 on these both sides Ahead [of sheet 5a], steering lever 5S which manage steering actuation of an airframe were turned up, and were set up in the front end section of the machine stool 2 which separated getting-on-and-off space section 5K, and 5d of front control actuator sections in which the footpedal 5F grade which manages actuation of the attachment activity machine which is not illustrated to the side of the base is installed is arranged. In addition, although drawing 1 shows a power shovel and drawing 2 shows the blade activity machine, the operation section 5 has same composition.

[0007] It forms a boom cylinder 47, an arm hydraulic cylinder 48, and a bucket hydraulic cylinder 49 in these, respectively, and is made to do each activity while the above-mentioned activity section 4 supports an arm 42 pivotably through a pivot 43 by the same configuration as an ordinary thing at the tip of the boom 41 supported pivotably by attachment section 3a of a mounting bracket 3 through a pivot 40 in a base as shown in drawing 3 (drawing 1), and it supports a bucket 45 pivotably through a bucket link 46 at the tip of this arm 42.

[0008] moreover -- the above -- each -- a cylinder -- 47 -- 48 -- 49 -- oil pressure -- a hose -- 47 -- a -- 48 -- a -- 49 -- a -- the following -- describing -- a configuration -- a mounting bracket -- three -- and -- a boss -- the section -- 20 -- pass -- a machine stool -- two -- forming -- having had -- opening -- two -- K -- inside -- a passage -- this -- a machine stool -- two -- inside -- installing -- having -- said -- a control lever -- five -- L -- five -- R -- a change-over -- actuation -- carrying out -- having -- not illustrating -- oil pressure -- a change-over -- a bulb (control valve) -- connecting -- **** .

[0009] Moreover, as shown in drawing 3 and drawing 4 , the above-mentioned mounting bracket 3 forms said attachment section 3a in the upper part of the body made from a casting, and forms in a front face attachment section 3b which supports a boom cylinder 47. And while projecting and forming in a left lateral attachment section 3c which supports the swing cylinder 45 attached in the machine stool 2 side, the attachment sections 31 and 32 which have the metal section for attachment pin 30 insertion formed in the rear face at the reverse KO character-like piece of a branch are protruded. And the centrum 33 which has the up-and-down through-holes 33a and 33b (drawing 3) is formed in the interior of a body, and said oil pressure hose 48a and 49a are made to insert in in this centrum 33.

[0010] It projects towards the front side of an airframe 2, and he is trying to, make the oil pressure hose 47a, 48a, and 49a as stated above etc. insert in the space section between both on the other hand while the upper boss section 21 and the bottom boss section 22 are made to estrange the boss section 20 prepared in the point of the formed machine stool 2 and it carries out division formation. That is, the machine stool 2 in this part constitutes in one cope box 2a and drag flask 2b which consist of a thick plate, and both the rims of cheek middle flask 2c in the shape of a front view hollow box frame from 2d of side frames, inserts in an oil pressure hose by carrying out the reentrant notch only of the point of side frame 2c between cope box 2a and cheek middle flask 2b by side view, and forms opening 2K which permit that ****.

[0011] And while fixing cylinder-like boss 21a which makes the attachment pin 30 insert in the point of cope box 2a where the attachment section 31 of said mounting bracket 3 is laid and forming the upper boss section 21, the point of cheek middle flask 2c and drag flask 2b forms the bottom boss section 22 in which carry out insertion support of said attachment section 32 at the letter of pinching, and the attachment pin 30 is made to insert. Thereby, a mounting bracket 3 can be supported possible [the revolution (swing actuation) to a longitudinal direction] centering

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on the attachment pin 30 in the boss section 20 of a machine stool 2 by inserting the attachment pin 30 in a single string, where the attachment sections 31 and 32 are positioned in the upper boss section 21 and the bottom boss section 22, respectively.
[0012] Moreover, while shafting the rotation roller 35 of the shape of a cylinder formed in the sliding side rotatable to the shank of the attachment pin 30 between the upper boss section 21 and the bottom boss section 22, when an oil pressure hose **** in said corner section of opening 2K, the sliding member 25 which can perform sliding guidance good is formed in 2d of both-sides frames. In addition, the above-mentioned attachment pin 30 is performing the baffle by attaching in a machine stool 2 fixed arm 30a which fixed in the upper part by attachment screw 30b, and fixing.
[0013] When a mounting bracket 3 circles in the activity section supporting structure constituted as mentioned above right and left centering on the attachment pin 30 by actuation of the swing cylinder 45, It follows on the actuation. Although the oil pressure hose 48a and 49a piped through the side of this attachment pin 30 follow a longitudinal direction (oil pressure hose group), they are set at the time of this subsequent movement. Since an oil pressure hose group can be performed where it approached the minor diameter attachment pin 30 and expansion-and-contraction inflection is lessened more as much as possible by the center-line-of-rotation side between the upper boss section 21 and the bottom boss section 22 While hose length can also shorten, receipts-and-payments actuation over opening 2K can also be lessened. Moreover, an oil pressure hose group is prevented good in consumption etc. while showing around smoothly with few sliding members 25 and the rotation roller 35 of resistance at the time of the above-mentioned subsequent movement actuation.
[0014]
[Effect of the Invention] Since the oil pressure hose opened for free passage by the activity section through the mounting bracket from opening of a machine stool can approach a minor diameter attachment pin between the upper boss section and the bottom boss section and can follow the above-mentioned mounting bracket when this mounting bracket circles right and left, where big refraction and the inflection of an oil pressure hose are controlled, it can follow smoothly, and can prevent consumption of an oil pressure hose etc.
[0015] Moreover, an oil pressure hose can prevent consumption etc. good while being able to operate smoothly by the sliding member of opening, and the body of revolution of an attachment pin at the time of subsequent movement actuation.

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the side elevation of a power shovel.
[Drawing 2] It is the top view of the same part as that of drawing 1 in a blade activity machine.
[Drawing 3] It is the side elevation showing the activity section supporting structure.
[Drawing 4] It is the top view of drawing 3 .
[Drawing 5] It is the side elevation showing the conventional example.
[Description of Notations]
1 Power Shovel 2 Machine Stool
3 Mounting Bracket 4 Activity Section
20 Boss Section 21 Top Boss Section
25 Sliding Member 30 Attachment Pin
35 Rotation Roller
47a, 48a, 49a Oil pressure hose

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